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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* JAMES R. COMBES,  
KAREN A. MOFFAT, and MARIA N.V. MCDOUGALL

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Appeal 2008-003622  
Application 10/762,155  
Technology Center 1700

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Decided: <sup>1</sup> July 27, 2009

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Before EDWARD C. KIMLIN, BRADLEY R. GARRIS, and  
CHARLES F. WARREN, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

DECISION ON APPEAL

Applicants appeal to the Board from the decision of the Primary Examiner finally rejecting claims 1 through 3, 6 through 14, 16, 17, and

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<sup>1</sup> The two month time period for filing an appeal or commencing a civil action specified in 37 C.F.R. § 1.304, begins to run from the Decided Date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

20 through 29 in the Office Action mailed August 23, 2006. 35 U.S.C.  
§§ 6 and 134(a) (2002); 37 C.F.R. § 41.31(a) (2006).

We affirm the decision of the Primary Examiner.

Claim 1 illustrates Appellants' invention of a process for depositing marking material onto a substrate, and is representative of the claims on appeal:

1. A process for depositing marking material onto a substrate which comprises (a) providing a propellant to a head structure, said head structure having at least one channel therein, said channel having an exit orifice with a width no larger than about 250 microns through which the propellant can flow, said propellant flowing through the channel to form thereby a propellant stream having kinetic energy, said channel directing the propellant stream toward the substrate, and (b) controllably introducing a particulate marking material into the propellant stream in the channel, wherein the kinetic energy of the propellant particle stream causes the particulate marking material to impact the substrate, and wherein the particulate marking material comprises toner particles which comprise a polyester resin, an optional colorant, and polypyrrole said toner particles having an average particle diameter of no more than about 10 microns and a particle size distribution of GSD equal to no more than about 1.25, wherein said toner particles are prepared by an emulsion aggregation process, said toner particles having an average bulk conductivity of at least about  $10^{-11}$  Siemens per centimeter.

The Examiner relies upon the evidence in these references (Ans. 3):

Sacripante	US 5,348,832	Sep. 20, 1994
Patel	US 5,403,693	Apr. 04, 1995
Peeters	US 6,328,409 B1	Dec. 11, 2001
Watanuki <sup>2</sup>	JP 3-100561 A	Apr. 25, 1991

Mark Alger, *degree of polymerization, high polymer, Polymer Science Dictionary* 124, 244 (2d ed., Chapman & Hall 1997) (hereafter Alger).

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<sup>2</sup> We refer to the translation of Watanuki prepared for the USPTO by Diplomatic language Services, Inc. (PTO 2001-3573 August 2001).

Appellants request review of the following grounds of rejection under 35 U.S.C. § 103(a) advanced on appeal by the Examiner (Br. 8):

claims 1 through 3, 6 through 9, 16, 17, and 22 through 29 over Peeters in view of Watanuki (Ans. 4);

claims 10 through 14 over Peeters in view of Watanuki as applied to claim 1 further in view of Patel (Ans. 6); and

claims 20 and 21 over Peeters in view of Watanuki as applied to claim 1 further in view of Sacripante (Ans. 7).

Appellants argue the claims in the first ground of rejection as a group and further argue claim 17 separately. Br. 9 and 18. Appellants argue the claims in the second and third grounds of rejection as a group. Br. 19 and 21. Thus, we decide this appeal based on claims 1, 10, 17, and 20.

37 C.F.R. § 41.37(c)(1)(vii) (2006).

#### Issues

The issues in this appeal are whether Appellants have shown that the evidence in the combined teachings of Peeters and Watanuki alone and as further combined with Patel and with Sacripante does not support the Examiner's conclusions of *prima facie* obviousness with respect to the claimed process for depositing marking material onto a substrate by independent claim 1 and dependent claims 10, 17, and 20, respectively.

#### Claim Interpretation

The plain language of representative independent claim 1 encompasses, in pertinent part, any process which provides a propellant containing a particulate marking material comprising toner particles to a head structure that directs a propellant stream toward any substrate. The claimed processes include the so called "ballistic aerosol marking" processes. Spec., e.g., 56:6-22 and Fig. 6; *see also*, e.g., 21-22. The

particulate marking material comprising toner particles comprises, among other things, any polyester resin and a polypyrrole, wherein the toner particles are prepared by any emulsion aggregation process. Dependent claim 10 specifies a particular emulsion aggregation process. Thus, the appealed claims are drafted in product-by-process format, and accordingly, encompass any particulate marking material comprising toner particles prepared by any process which results in the characteristics imparted by any emulsion aggregation process in independent claim 1, and by the specified steps of an emulsion aggregation process in dependent claim 10. *See, e.g., In re Thorpe*, 777 F.2d 695, 697 (Fed. Cir. 1985), and cases cited therein (“even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself”). Dependent claim 17 specifies the polypyrrole has about 6 to about 100 repeating monomer units. Dependent claim 20 specifies the polypyrrole is doped with one or more specified anions.

Appellants contend the claim term “emulsion aggregation process” of claim 1 is specifically defined at page 74, lines 17 to 27 of the Specification. Br. 17-18. This generic disclosure is not specific to a process for forming the toner particles specified in claim 1, and thus, there is no basis in the language of claim 1 or in the Specification on which to read this disclosure into claim 1 as a limitation as the Examiner points out. Ans. 10. *See, e.g., In re Zletz*, 893 F.2d 319, 321-22 (Fed. Cir. 1989).

#### Findings of Fact

We find Peeters would have disclosed to one of ordinary skill in this art a ballistic aerosol marking apparatus and processes which direct a propellant stream containing any marking material, such as toner particles, toward any substrate. Peeters, e.g., abstract, col. 2, ll. 19-37, col. 3, ll. 28-55, and col. 13, l. 14 to col. 15, l. 24. The toner particles can contain charge control additives, be in a suspension which can include a charge director, and used in processes which take advantage of charged particles. Peters, e.g., col. 3, ll. 30-33, col. 15, ll. 36-53, and col. 25, ll. 16-30.

We find Watanuki would have disclosed to one of ordinary skill in this art toner particles for electrophotographic compositions in which a conductive polymer, which can be polypyrrole, is adhered to the surface of a core material, which can include polyester resin. Watanuki, e.g., 2 and 4-8, and Working Examples 1 and 4. The polypyrrole can be doped with, among other things, alkylbenzenesulfonic acid and benzenesulfonic acid anions. Watanuki 5-6. The amount of the materials making up the toner particles is determined based on the desired resistivity of the toner particle. Watanuki 6-8 and 10-11, and Working Examples 1 and 4. The conductive polymer can be an extremely thin layer that covers the core. Watanuki 10. The toner particles can be obtained by, among other things, polymerizing a monomer composition in an emulsified suspension. Watanuki 7:15-18.

We find Patel would have disclosed to one of ordinary skill in this art emulsion aggregation processes for preparing toner compositions, which toners can be used in electrophotographic processes, wherein the toner comprises polyester resin. Patel, e.g., col. 1, ll. 6-59, col. 9, ll. 13-45, and col. 13, ll. 34-44.

We find Sacripante would have disclosed to one of ordinary skill in this art emulsion aggregation processes for preparing toner compositions, which toners can be used in electrophotographic processes, wherein the toner comprises sulfonated polyester resin. Sacripante, e.g., col. 1, ll. 5-61, col. 7, l. 6 to col. 8, l. 2, and col. 10, ll. 30-47.

A discussion of the definitions of the terms degree of polymerization and high polymer in Alger is not necessary to our decision.

#### Opinion

We considered the totality of the record in light of Appellants' arguments with respect to claims 1, 10, 17, and 20 and the grounds of rejection advanced on Appeal. *See, e.g., In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006) (“On appeal to the Board, an applicant can overcome a rejection by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness.”) (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998)); *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992) (“After evidence or argument is submitted by the applicant in response, patentability is determined on the totality of the record, by a preponderance of evidence with due consideration to persuasiveness of argument.”) (citing, *inter alia*, *In re Spada*, 911 F.2d 705, 707 n.3 (Fed. Cir. 1990)).

We are of the opinion Appellants have not established that the evidence in the combined teachings of Peeters and Watanuki alone and as further combined with Patel and with Sacripante does not support the Examiner's conclusions of *prima facie* obviousness of the claimed process encompassed by claims 1, 10, 17, and 20, respectively.

We cannot subscribe to Appellants' arguments that Watanuki does not disclose a process for preparing the electrophotographic toner particles by an emulsion aggregation process falling within claim 1. Br. 17-18. We interpreted claim 1 to encompass any manner of emulsion aggregation process, and Appellants do not adduce argument or evidence establishing that Watanuki's process of polymerizing a monomer in an emulsified suspension is not an emulsion aggregation process. Br. 17-18; *see above* pp. 4 and 5. In similar respect, Appellants do not dispute that Patel's emulsion aggregation process falls within claim 10 and can be used to prepare Watanuki's electrophotographic toner particles as the Examiner contends. Br. 19-21; Ans. 10. Appellants also do not dispute the teachings of Sacripante, or that Watanuki discloses polypyrrole doped with an anion falling within claim 20. Br. 20-21.

We also cannot subscribe to Appellants' arguments that Watanuki would not have suggested toner particles having a polypyrrole cover layer of repeating monomer units within the range specified in claim 17 to one of ordinary skill in this art. Br. 18-19. Indeed, Appellants do not adduce argument or evidence establishing that this person in routinely following the teachings of Watanuki would not have arrived at the thus claimed toner particles, and we fail to find in the reference a requirement for a "high polymer" as argued by Appellants. Br. 18-19; *see above* p. 5. Watanuki teaches that the amounts of the materials for the toner particles are selected based on the desired resistivity of the particles, and in this respect, the number of repeating monomer units in the polypyrrole cover would depend on the size of the particle. *See above* p. 5. Thus, we are of the opinion that



this person would have reasonably arrived at a workable or optimum range for the number of repeating monomer units in the polypyrrole cover of Watanuki's toner particles by routine experimentation. *See, e.g., In re Boesch*, 617 F.2d 272, 276 (CCPA 1980) (“[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art.”); *In re Aller*, 220 F.2d 454, 456 (CCPA 1955) (“[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.”). We are further of the view that the workable or optimum range would reasonably fall within, overlap with, or be close to the repeating monomer unit range in claim 17. *See, e.g., In re Geisler*, 116 F.3d 1465, 1469-70 (Fed. Cir. 1997), and cases cited therein (claimed invention with range of 50 to 100 Angstroms rendered *prima facie* obvious by reference teaching a range that overlapped at end point with the claimed range); *In re Woodruff*, 919 F.2d 1575, 1577-78 (CCPA 1990) (where the difference between the claimed invention and the prior art is a range, applicant must show that the claimed range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range); *Titanium Metals Corp. of Am. v. Banner*, 778 F.2d 775, 783 (Fed. Cir. 1985) (“proportions [of metal content in alloys] so close that *prima facie* one skilled in the art would have expected them to have the same properties).

We further disagree with Appellants' position that one of ordinary skill in this art would not have been led to combine the teachings of Peeters and Watanuki alone and further with Patel and with Sacripante, and thence to the claimed processes encompassed by claims 1, 10, 17, and 20. Br. 10,

12-14, 20-21, and 22. Appellants do not dispute that Peeters discloses ballistic aerosol marking processes which use toner particles that satisfy the process parameters with respect to directing the propellant stream containing a toner particle toward a substrate specified in claim 1. Br. 10; *see above* p. 5. We determined above that Watanuki along with Patel and Sacripante would have described toner particles which satisfy the toner particle requirements specified in claims 1, 10, 17, and 20.

On this record, we are unconvinced by Appellants' arguments that one of ordinary skill in this art, following Peeters' disclosure that toner particles that can possess or are associated with an electrostatic charge are useful in the disclosed ballistic aerosol marking processes, would not have been motivated to use the electrophotographic toner particles having a polypyrrole conductive covering taught by Watanuki and the other references in Peeters' process with a reasonable expectation of success, as the Examiner contends. Br. 10, 12-14, 20-21, and 22; Ans. 5-6, 7, 8-9, and 10; *see above* p. 5. As the Examiner points out, Peeters describes the kind of toner particles taught by Watanuki and the other references, and Appellants do not dispute that the thus taught toner particles would function in Peeters' processes. Ans. 5-6, 7, 8-9, and 10; Br., e.g., 10 and 12-14. Indeed, it is the properties of the toner particles taught by Watanuki and the other references which would have led one of ordinary skill in this art to select the same for Peeters' processes, and this person would not have expected a different result based on the analogous use thereof as marking material in electrophotographic and xerographic processes disclosed by Watanuki as Appellants contend. Br., e.g., 12-14, and 21. *See, e.g., KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398,

417 (2007) (a patent claiming a combination of elements known in the prior art is obvious if the improvement is no more than the predictable use of the prior art elements according to their established functions); *In re Sovish*, 769 F.2d 738,

742-43 (Fed. Cir. 1985) (skill is presumed on the part of one of ordinary skill in the art); *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (“The test for obviousness is . . . what the combined teachings of the references would have suggested to those of ordinary skill in the art.”).

Thus, the evidence in the combined teachings of Peeters and Watanuki alone and as further combined with Patel and with Sacripante clearly establishes that one of ordinary skill in this art would have had ample direction to combine the teachings of the references with a reasonable expectation of successfully using Watanuki’s toner particles in Peeters’ processes, and not “that it would be obvious to try the combination in the cited references” as Appellants argue. Br. 14. *See KSR*, 550 U.S. at 421 (“When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under § 103.”); *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1364 (Fed. Cir. 2007) (“the expectation of success need only be reasonable, not absolute”); *In re O’Farrell*, 853 F.2d 894, 903-04 (Fed. Cir. 1988) (“For

obviousness under § 103, all that is required is a reasonable expectation of success.” (citations omitted)).

Accordingly, based on our consideration of the totality of the record before us, we have weighed the evidence of obviousness found in the combined teachings of Peeters and Watanuki alone and as further combined with Patel and with Sacripante, with Appellants countervailing evidence of and argument for nonobviousness and conclude, by a preponderance of the evidence and weight of argument, that the claimed invention encompassed by appealed claims 1 through 3, 6 through 14, 16, 17, and 20 through 29 would have been obvious as a matter of law under 35 U.S.C. § 103(a).

The Primary Examiner’s decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(v).

**AFFIRMED**

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